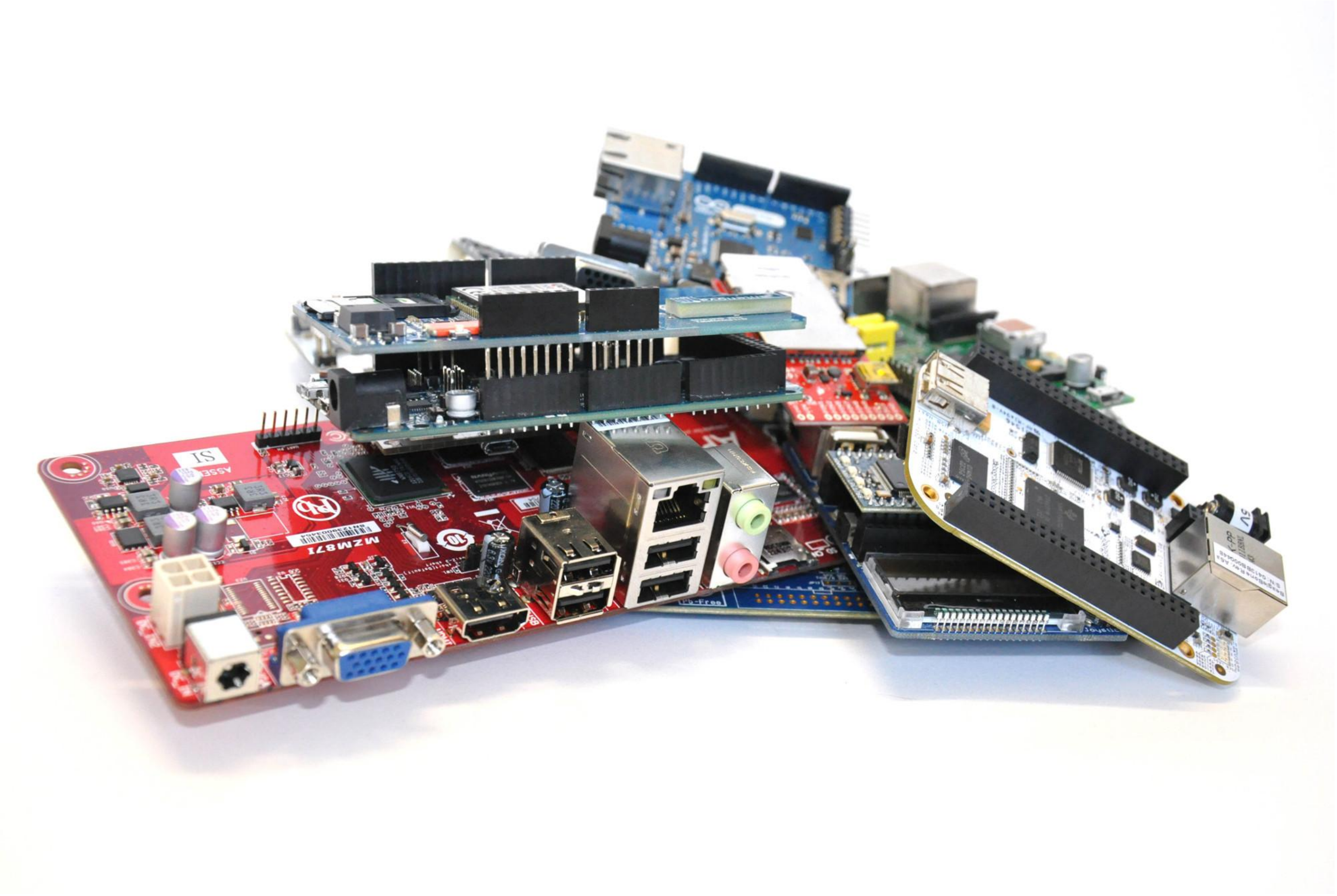
Using Clojure to Serve The Internet of Things



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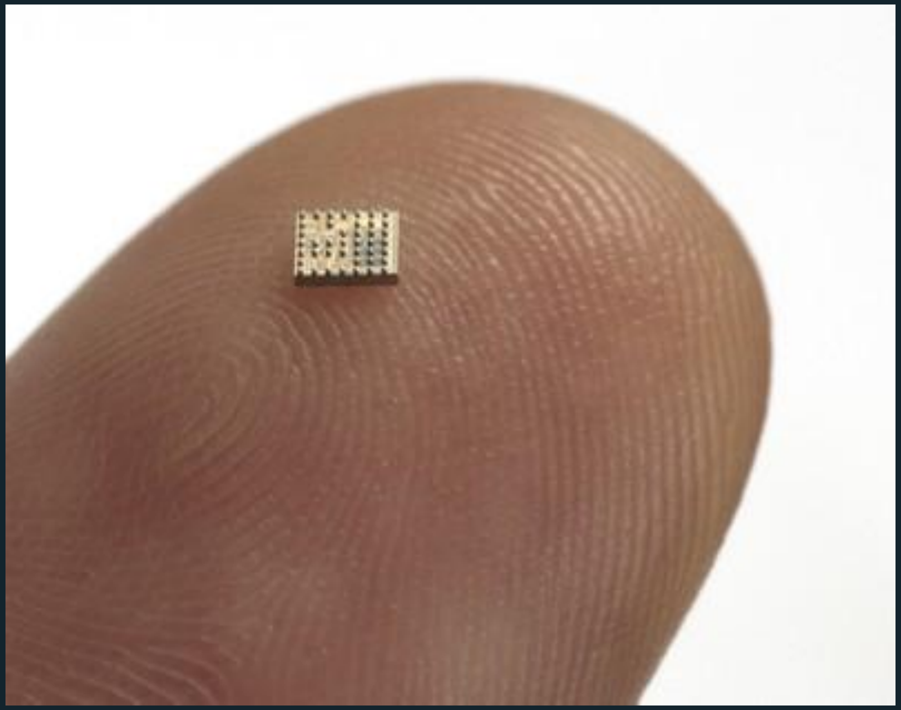
xively™

by LogMeIn

What is The Internet of Things (really)?



- Number of connected devices
  - 1.1B PCs
  - 5.8B Mobile devices
  - 1T “Things”
- Tiny and cheap
  - 2 mm^2 32-bit computer with wifi for $1
- Massive data volumes

- The CPUs on the smallest devices are tiny
  - 128 kB of flash / 32 kB of RAM

- Radios

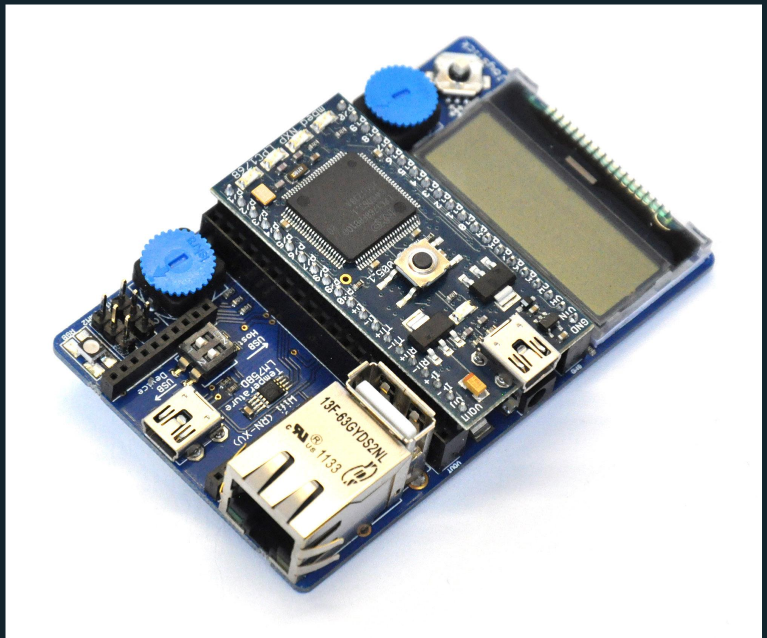
- Battery powered
  - 50 bytes/hour for 10 years on 2xAA lithium batteries

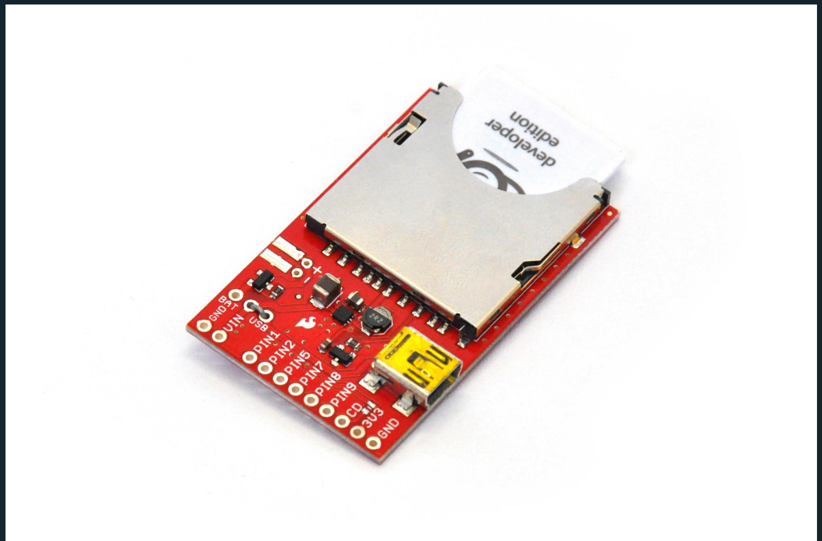
- Protocols

- Why is it going to take off this time?
  - Devices
  - Efficiency / new business models
  - Data

- Main challenges in a IoT world
  - Directories / discovery
  - Provisioning
  - Security

- How do I get IoT on my CV?
  - Development kits (“get your C on”)
    - Electric IMP
    - mBed
    - Raspberry PI
    - Arduino
    - BeagleBone
    - etc
  - Write web/mobile apps
  - Cascalog (open data-sets)

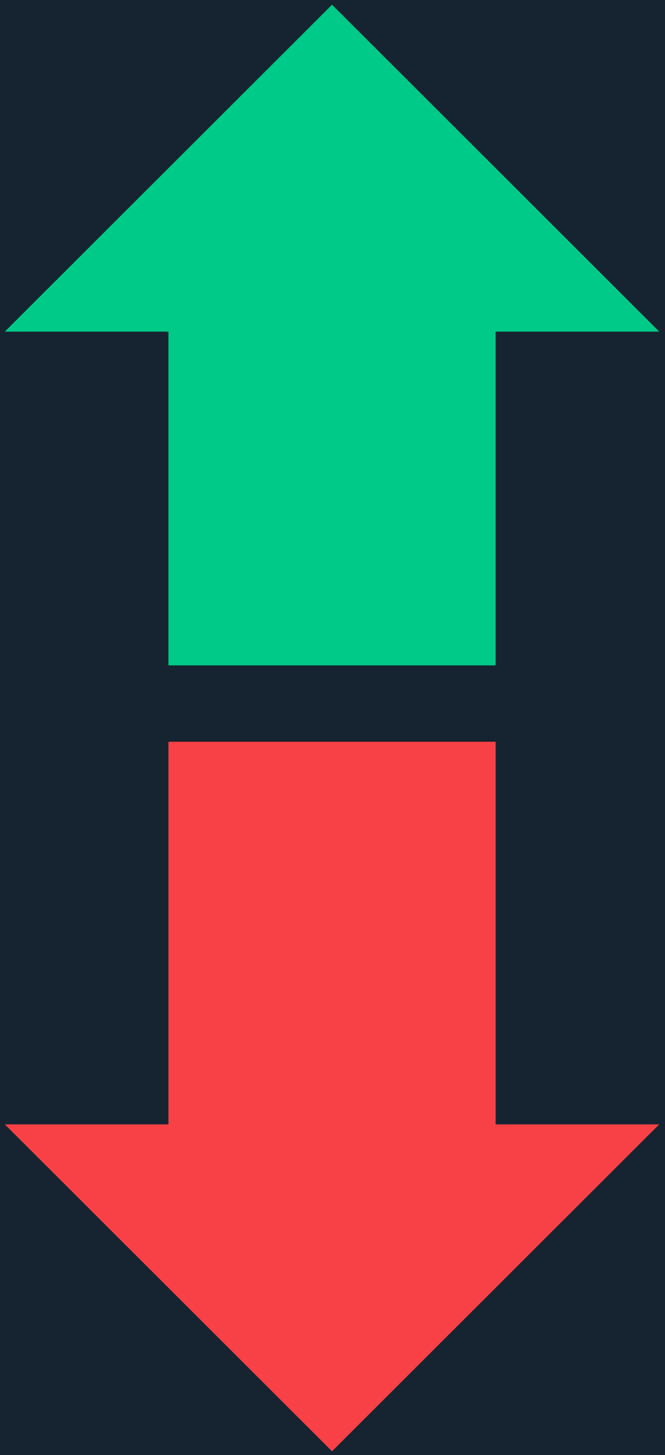




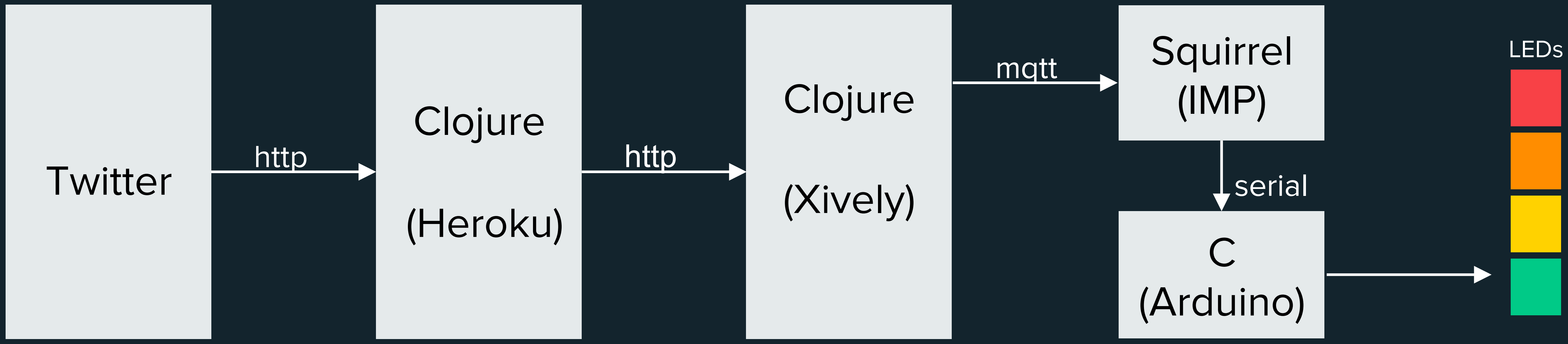
Demo

#EuroClojure

#RailsConf



Behind the Scenes

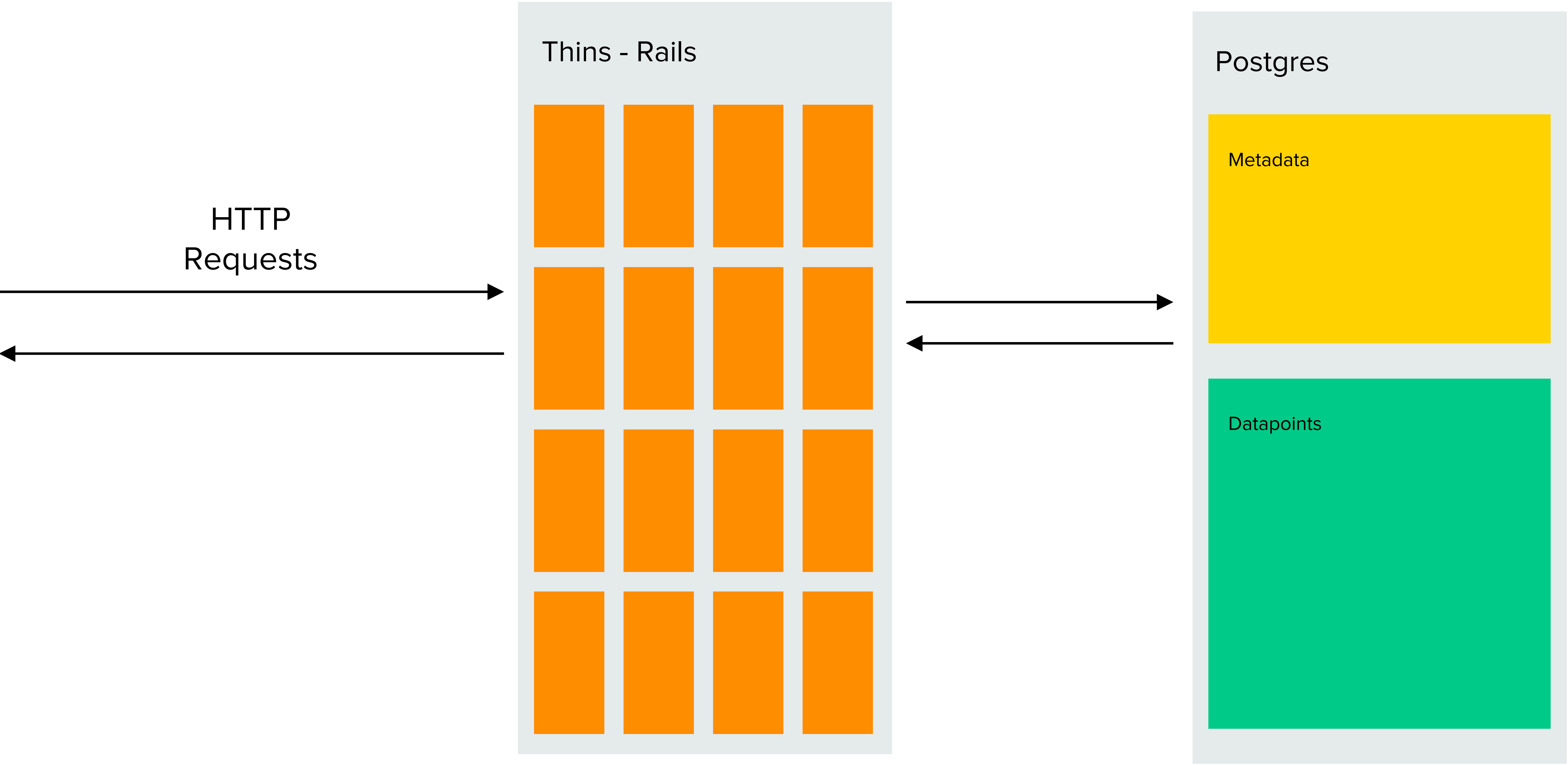


https://github.com/martintrojer/euroclojure-demo

Reaching

Clojure

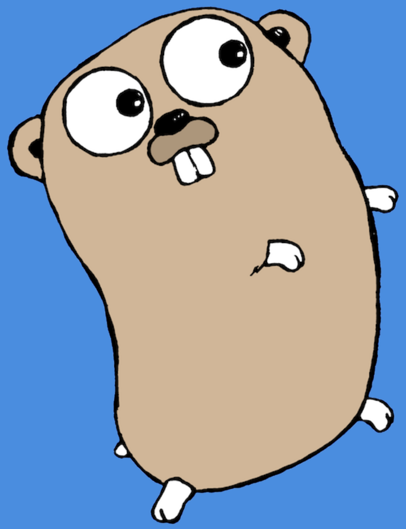
Rails Architecture 1.0



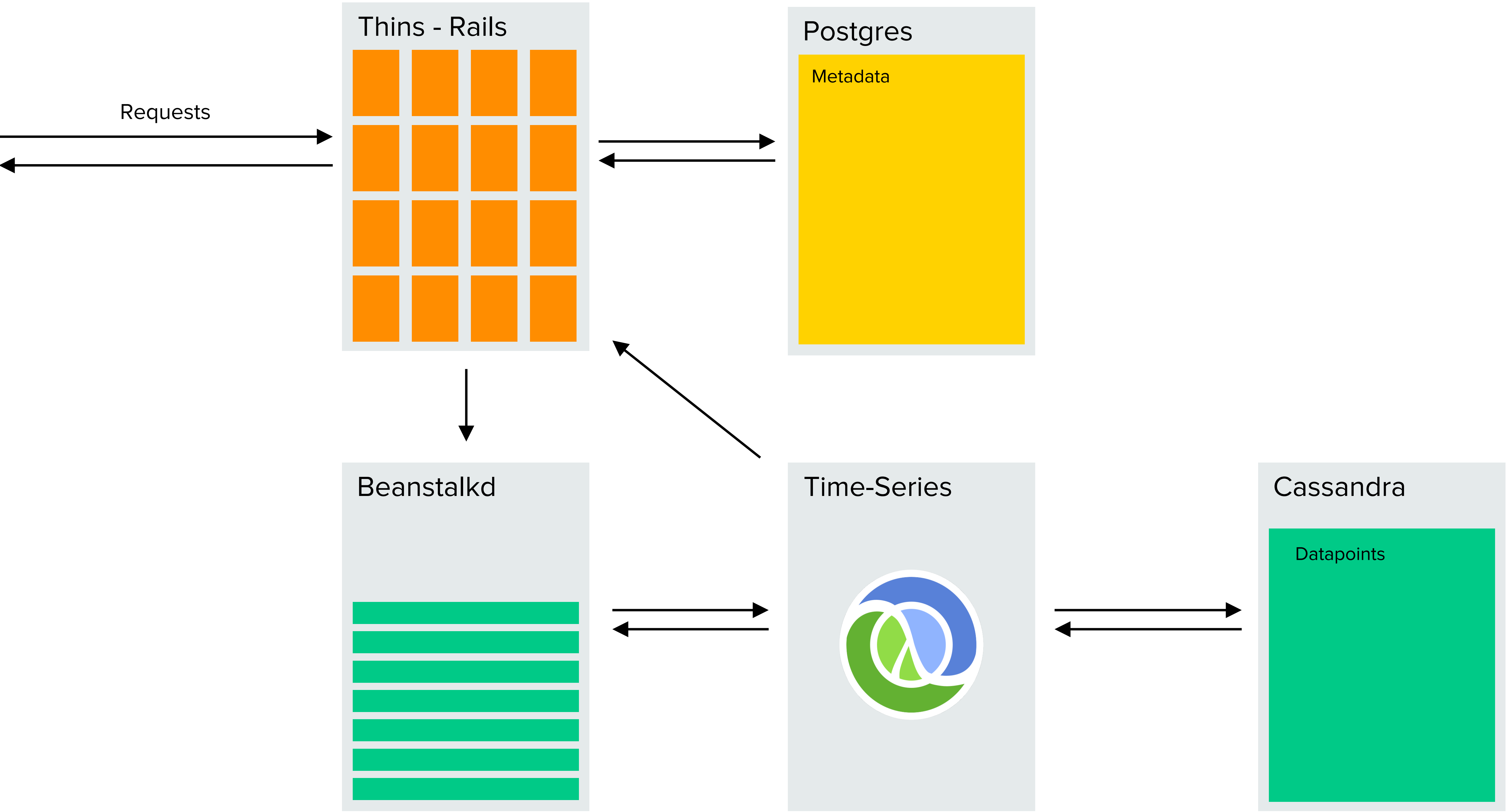
ruby on rails

What are the options?

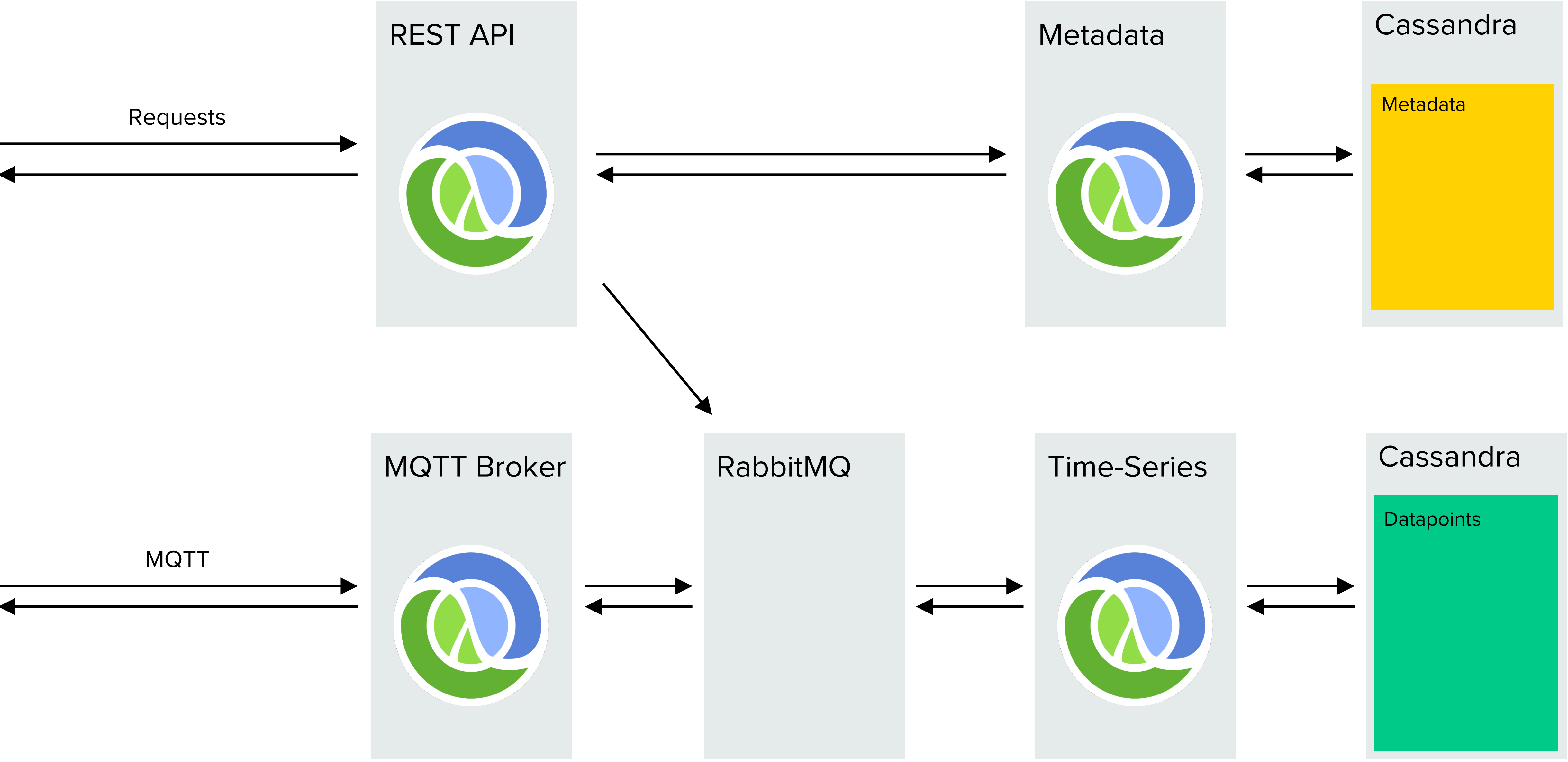
node
JS
™



Rails Architecture 1.1



~~Rails~~ Architecture 2.0



How We Switched

- Introducing Clojure to the team
- No big-bang rewrite everything
- Don’t shock-and-awe developers in the team
- Let people stick with what they know
- Build trust

Wins

- Powerful abstractions
- Code is much more declarative
- Performance
- Language aesthetics

Pain Points

- JVM / Clojure start time
- OMG, the stack traces!

- Easy to get confusing version clashes in lein

- Tooling most mature round Emacs (we were all using VIM)

- Where is the debugger?

Idioms We Use

- Sierra’s Reloaded
- TDD
- Rails Conventions
- Simple Data-structures

Growing ‘Team Clojure’

- (not so) Forced Re-education
- Recruiting
- We’re hiring!

What’s Next?

- Time series Data Analysis
- Async micro service APIs and state machines
- Trigger rules
- Re-visit the ‘logged-in’ / non-static website

- Testing
    - Simulation Testing
    - Test as data
    - Building confidence